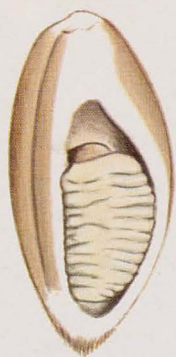


PRINCIPAL STORED GRAIN INSECTS

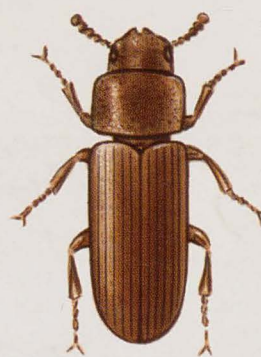
For safe and effective use of insecticides, always identify the problem correctly.



1. Granary weevil



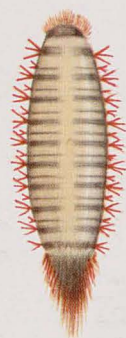
2. Saw-toothed grain beetle



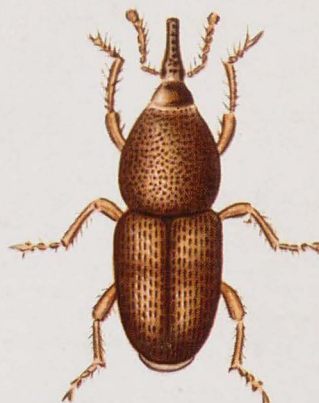
3. Red flour beetle



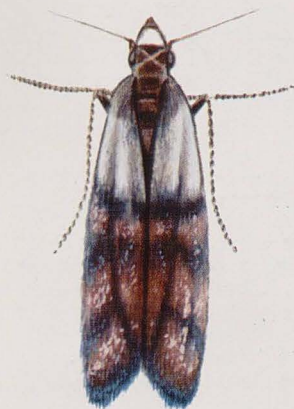
4. Larger cabinet beetle



5. Lesser grain borer



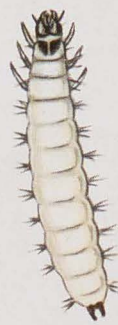
6. Rice weevil



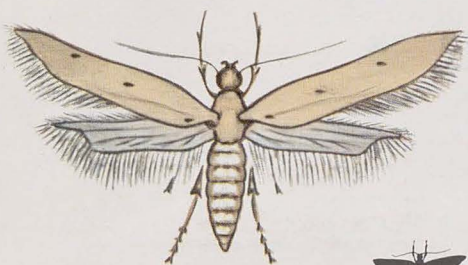
7. Indian-meal moth



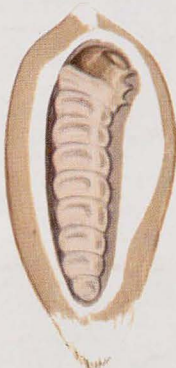
8. Cadelle



9. Flat grain beetle



10. Angoumois grain moth



Some of these stored grain insects are also
KITCHEN PESTS.

The saw-toothed grain beetle, red flour beetle, larger cabinet beetle, and Indian-meal moth develop in flour, cake mixes, corn meal, breakfast foods and similar products. The Angoumois grain moth infests popcorn.

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PRINCIPAL STORED GRAIN INSECTS

1. **GRANARY WEEVIL**, *Sitophilus granarius* (Linnaeus). This true weevil, along with the closely related rice weevil, is among the most destructive of all stored grain insects. The larvae develop inside stored kernels of whole grain making an infestation difficult to remove in the milling process. This weevil is largely a pest of stored wheat, corn, and barley, especially in elevators, mills, and bulk storages. The adult granary weevil can't fly, and field infestations don't occur in Minnesota.

2. **SAW-TOOTHED GRAIN BEETLE**, *Oryzaephilus surinamensis* (Linnaeus). Along with flour beetles, the saw-toothed grain beetle is one of the most common insects in stored grain and cereal products. The larvae develop in flour, cereal products, and many other dried foods. For this reason, it is a common pest not only in grain bins, but also in elevators, mills, processing plants, warehouses, and kitchens. In grain bins, it feeds on broken kernels and grain residues.

3. **RED FLOUR BEETLE**, *Tribolium castaneum* (Herbst). This beetle is similar to the saw-toothed grain beetle in habits and types of products infested. It is a serious pest in flour mills and wherever cereal products and other dried foods are processed or stored. Like the confused flour beetle (not pictured), the red flour beetle may impart a bad odor that affects the taste of infested products.

4. **LARGER CABINET BEETLE**, *Trogoderma in-clusum* (LeConte). Representing a group also referred to as *Trogoderma*, the larger cabinet beetle is a scavenger that feeds on cereal products and dried animal matter. The fuzzy, slow-moving larvae—similar to the larvae of carpet, hide, and larder beetles—are often found crawling on or near the products they infest.

5. **LESSER GRAIN BORER**, *Rhyzopertha dominica* (Fabricius). This pest is most common and destructive in warm climates, but can spread to any area in transported grain. It is only a problem of grain and not cereal products. The larvae develop inside the kernels of whole grain. The adults also damage grain by boring into the kernels and leaving them covered with powder from the chewed material.

6. **RICE WEEVIL**, *Sitophilus oryzae* (Linnaeus). The rice weevil is similar to the granary weevil in both appearance and habits. The name is misleading, however, since it infests other grains besides rice. Adult weevils can fly and, in warm climates, can cause widespread damage to corn, wheat, and other grains before harvest. Although field infestations don't occur in Minnesota, post-harvest infestations do. Such infestations originate from shipped-in grain or from already infested storages.

7. **INDIAN-MEAL MOTH**, *Plodia interpunctella* (Hubner). Common to both stored grain and cereal products, Indian-meal moth larvae cause damage in

corn meal, packaged foods, bagged grain, and grain in storage. Attack is confined to surface layers of stored, shelled corn, and small grains. With stored ear corn, however, feeding occurs anywhere, since the moths crawl among the ears to lay eggs. Larval feeding is characterized by a webbing of the material infested. The mature larvae then often leave the material and crawl about in homes or buildings in search of a place to pupate.

8. **CADELLE**, *Tenebroides mauritanicus* (Linnaeus). Both the adult and larva are large and easy to see, feeding mainly on the germ of stored grains. They may also attack milled cereal products. The larvae leave stored grain in the fall and burrow into woodwork, such as wooden bins or boxcars, to hibernate and may also burrow into packaged cereal products, thus providing an entrance for other cereal pests.

9. **FLAT GRAIN BEETLE**, *Cryptolestes pusillus* (Schonherr). This is a tiny beetle that feeds primarily on the germ of stored grains, especially wheat. It is readily attracted to high-moisture grain. In fact, under high moisture conditions, the flat grain beetle may also develop in many cereal products, but it isn't a common pest in kitchens.

10. **ANGOUMOIS GRAIN MOTH**, *Sitotroga cerealella* (Olivier). This is a common and destructive pest of crib ear corn. It also infests stored, shelled corn and other small grains, but attack is confined to the surface layer of grain. The larvae develop within the kernels; therefore, the Angoumois grain moth isn't a pest of cereal products. Infestations in homes often occur in stored popcorn or in colored ears of corn kept for decoration purposes. The moth resembles the clothes moth but doesn't shun light.

Current Control Information

The information and color illustrations presented here are designed to help you correctly identify the stored grain insects commonly found in Minnesota. These insect pests and the problems they cause do not change, but the methods of dealing with them do. University extension entomologists have prepared the following publications to keep grain producers and consumers up-to-date on the latest recommended control methods and materials:

Fact Sheet No. 8—Controlling Indian Meal-Moth in Stored Shelled Corn.

Fact Sheet No. 9—Insects in Stored Grain.

Fact Sheet No. 13—Pantry Pests.

Single copies of these publications, which are revised periodically, may be obtained by Minnesota residents, free of charge, from their local County Extension Office, or from the Bulletin Room, Institute of Agriculture, University of Minnesota, St. Paul, Minnesota 55101.